

KEITH L. ETCHELLS, PG, CHg

Education

BS – Environmental Geology, Colorado State University, 1999

Professional Licenses

Professional Geologist – California (No. 8028)

Professional Hydrogeologist – California (No. 981)



Specialty Certifications/Duties

OSHA 40-Hour EPA-Approved Hazardous Waste Operations and Emergency Response Training
SCS Quality Management Coordinator for Southwestern Business Unit

Professional Experience

Mr. Etchells is a professional geologist and hydrogeologist with 23 years of experience assisting clients in managing environmental risks associated with ownership, transfer, or operation of commercial, industrial, and waste disposal properties. His particular technical expertise involves aspects of groundwater science and engineering relevant to contaminated sites and landfills, including supervision and conduct of subsurface data acquisition, remedial design and implementation, conceptual site model development, aquifer testing, extraction well design, groundwater quality evaluation and treatment, vapor intrusion health risk assessment and mitigation, predictive modeling, and contaminated soil and groundwater remediation design. He is responsible for designing analytical, geotechnical, and hydrogeological data collection programs to complete subsurface assessment and remediation. He has prepared subsurface assessment documents, property mitigation plans, vapor intrusion risk assessment documents, soil management plans, aquifer characterization documents, conceptual site models, and groundwater remedial design and implementation documents.

He has experience with several environmental regulatory entities, including the County of San Diego Department of Environmental Health (DEH), the California State Water Quality Control Board (SWQCB), including Colorado River Basin Region/Los Angeles/Santa Ana/San Diego/Lahontan Regional Water Quality Control Boards (RWQCBs), and the Department of Toxic Substances Control (DTSC).

Mr. Etchells's project experience is summarized below.

Former Dry Cleaners Assessment and Remediation. Mr. Etchells is technical advisor on a former dry cleaner site in Henderson, Nevada where chlorinated solvents impacted subsurface soil and groundwater with chlorinated volatile organic compounds including tetrachloroethene and trichloroethene. He designed and oversaw the implementation of subsurface assessment and remediation work plans approved by the Nevada Division of Environmental Protection including groundwater delineation and industry-leading technologies including targeted source zone excavation coupled with biotic and abiotic in situ chemical reduction.

IQHQ Research & Development District, Due Diligence/Redevelopment Project, San Diego, CA.

Mr. Etchells supported the redevelopment of eight contiguous blocks in downtown San Diego known as Manchester Pacific Gateway, a mixed-use project. He completed subsurface investigations to delineate subsurface contamination associated with former USTs and large quantities of

undocumented fill found on the site. Lithologic and analytical characterization were determined using geophysical surveys, exploratory excavations, and drilling. The extent of lead and other constituents of concern found in the exported soil were identified during the project using in situ techniques, including x-ray fluorescence and laboratory analyses. Mr. Etchells managed field activities associated with fill and native sediment characterization, waste stream management, and segregation of excavated fill soils to ensure proper waste documentation for disposal.

Former Maryland Square Shopping Center Dry Cleaners Release Assessment and Remediation.

Mr. Etchells was technical advisor on a former dry cleaner site in Las Vegas, Nevada where chlorinated solvents impacted subsurface soil, soil vapor, and groundwater beneath down gradient commercial and residential neighborhoods. He designed and oversaw the implementation of feasibility testing to employ in situ remedial technologies in a high sulfate groundwater regime. Findings of the feasibility study were presented to the Nevada Division of Environmental Protection.

City of San Diego, Environmental Assessment of Mission Bay Landfill, San Diego, CA. Mr. Etchells assessed environmental conditions at the unlined Mission Bay Landfill in San Diego, CA. To determine data requirements for an HRA, he evaluated hydrogeologic data collected from a subsurface assessment at the site. He was responsible for geologic characterization and designing additional monitoring wells that augmented an existing monitoring well network. To properly design a groundwater monitoring and sampling program, Mr. Etchells completed a tidal influence study that evaluated the characteristics of the groundwater regime.

Bianchi Family Trust, Groundwater Monitoring for Former Bianchi International Facility Investigation and Remediation, Temecula, CA. Mr. Etchells conducted a site investigation to delineate the extent of petroleum hydrocarbon-bearing soil and groundwater from a former underground storage tank (UST). He developed a conceptual site model and used it to identify a remediation approach that met San Diego RWQCB requirements. Mr. Etchells managed the construction and operation of a dual-phase, high-vacuum extraction system to mitigate soil and groundwater impacts. He prepared a fate and transport model to support a risk-based closure under the Low-Threat UST Case Closure Policy.

Omar Tartir, Phase II Subsurface Assessment for Former Orange Glen Market. Mr. Etchells conducted subsurface assessment of soil, soil vapor, and groundwater at a former fueling station, completing the delineation of subsurface impacts to maintain compliance with an RWQCB Cleanup and Abatement Order. Assessment data were used to prepare a detailed conceptual site model. He successfully prepared and implemented several interim remedial action work plans, including source zone remedial excavation, dual-phase extraction, direct-push in situ chemical oxidation, and automated groundwater recirculation for aerobic bioremediation of the residual source zone. Design and implementation of a fruit tree sampling, analyses, and human health risk assessment to address community concerns.

Several Dry Cleaner Assessments and Remediation. Mr. Etchells has managed several sites throughout San Diego and Los Angeles Counties that were associated with subsurface impacts caused by releases of dry cleaning solvent containing chlorinated hydrocarbons. He has conducted subsurface assessment and remediation activities to delineate impacts to soil, soil vapor, and groundwater. He has designed and implemented subsurface investigations defining the lateral extent of contamination and screening-level vapor intrusion risk assessments. He has received numerous approvals for remedial designs by regulating entities such as the Los Angeles Regional RWCQB, the San Diego County Regional RWCQB, and the County of San Diego DEH. Mr. Etchells has successfully implemented remedial activities, including chlorinated solvent-bearing soil excavation, enhanced anaerobic bioremediation, and in situ chemical reduction via borehole and well injection. He has experience managing assessment and remediation projects funded by the State of California Site Cleanup Subaccount Program (SCAP).

Hines Riverwalk, Mission Valley, CA. Mr. Etchells was on the clean fill import team for the project to verify and document all project infill met environmental testing requirements. Designed and implemented soil export site soil sampling programs to produce soil quality profiles in accordance with the DSTC Clean Fill for Schools criteria.

Pala Vista Market, Valley Center, CA. The Pala Vista Market contained a retail gas station with petroleum hydrocarbon-impacted soil and groundwater in a fractured bedrock groundwater regime. Mr. Etchells conducted a subsurface investigation to complete the delineation of an extensive fuel oxygenate plume at this site. He completed interim remedial activities that included installation, operation, and management of a groundwater treatment and recirculation system, coupled with an engineered anaerobic oxidation bioremediation. As part of the groundwater delineation activities at this site, Mr. Etchells negotiated access to several downgradient privately owned wells in a public receptor survey directed by the RWQCB.

City of Poway Redevelopment Agency, Corrective Action Plan (CAP) for Former Poway Auto Repair Facility, Poway, CA. Mr. Etchells assessed the lateral extents of subsurface impacts associated with a UST system for a former auto repair facility in Poway, CA. The assessment included design, installation, and periodic monitoring and sampling of a monitoring well network in accordance with County of San Diego DEH requirements. Using information from the assessment, Mr. Etchells produced a conceptual site model and a CAP to restore and protect the beneficial use of groundwater in protection of human health and environmental safety. He successfully obtained regulatory closure by demonstrating natural attenuation of residual impacts as a viable remedial alternative.

COMM22, LLC, Due Diligence/Redevelopment Project, San Diego, CA. Mr. Etchells supported the redevelopment of three blocks in downtown San Diego known as COMM22, an affordable housing complex. He conducted a subsurface investigation to delineate soil and groundwater contamination associated with former USTs and large quantities of undocumented fill found on the site. Lithologic and analytical characterizations were determined using geophysical surveys, exploratory excavations, and drilling. The extent of lead and other constituents of concern found in the shallow subsurface soil were identified as well. During site redevelopment, Mr. Etchells assisted in the monitoring and segregation of excavated fill soils to ensure proper transportation off site.

La Entrada Housing Investors, LP, Exploratory Trenching and Preparation of Phase II Redevelopment, San Diego, CA. La Entrada Family Apartments is an affordable housing redevelopment project in downtown San Diego. Mr. Etchells conducted a subsurface investigation to delineate soil and groundwater contamination as a guide to mass excavation activities. Lithologic and analytical characterizations were determined through geophysical surveys, exploratory excavations, and drilling. Mr. Etchells managed contaminated soil excavation, waste characterization, and disposal activities performed on the site. He supported the preparation of a property mitigation plan as well as a property closure report documenting the assessment, remediation, and health risk analysis for the complete remediation of hazardous substances for construction.

The Legend. During mass excavation for three levels of underground parking, 11 releases of hazardous substances were discovered by the development company's contractor. Mr. Etchells assessed and remediated the hazardous substances released at the site, ensuring the avoidance of delays with the construction schedule. Mitigation activities included excavating for removal of lead, polynuclear aromatic hydrocarbons, burn ash, a 14.5-foot-diameter cistern classified as Resource Conservation and Recovery Act (RCRA) hazardous waste, and a UST. Mr. Etchells conducted on-site monitoring during excavation activities, while managing waste characterization and profiling

activities, and preparing recapitulating documents outlining a detailed description of completed activities for the regulatory agency.

City of San Diego, Phase II Work Plan for Brown Field Airport Fuel Farm, San Diego, CA. The City of San Diego owned sites requiring closure due to USTs. This included 17 sites with 36 separate release cases and 36 USTs at Brown Field Airport. To assess soil and groundwater impacts, Mr. Etchells conducted a site investigation at a former aviation fuel farm at Brown Field Airport. Air rotary drilling technology was used to extend soil borings through multiple layers of resistive lithology, reaching depths of 200 feet below grade. In addition, Mr. Etchells completed groundwater sampling on the existing monitoring well network, and documented his findings for the regulatory agency.

Downtown San Diego Remediation Projects. Six large-scale redevelopment projects in downtown San Diego required Mr. Etchells's expertise in mitigation of organic- and heavy metal-contaminated soils. These mitigation activities included the collection of geologic and analytical data using geophysical methods, exploratory excavations, and drilling. This allowed Mr. Etchells to produce geologic maps by using the characterization of subsurface lithology methods. He has managed excavations on sites, focusing specifically on layers of heavy metal-contaminated soils using field screening techniques (x-ray fluorescence [XRF]) and laboratory analysis for proper transportation and disposal. To comply with regulatory agencies, Mr. Etchells has prepared numerous property mitigation plans and property closure reports.

Bonanza Wholesale, Phase II Environmental Assessment for Corvette Site Closure, San Diego, CA. Under the San Diego County DEH Voluntary Assistance Program, Mr. Etchells was an integral contributor in obtaining closure for the former Bonanza Corvette dealership in downtown San Diego. He completed a subsurface investigation using geologic characterization methods while collecting and analyzing geotechnical data and designing a monitoring well network. The findings of the subsurface investigation guided the mitigation of 6 hydraulic lift vaults and 10 USTs. In addition, he prepared geologic and hydrogeologic interpretations and conclusions revealed in the subsurface investigation and human HRA report.

North County Fire Protection District UST Site, Fallbrook, CA. Contaminated groundwater was found at the North County Fire Protection District facility when USTs were removed. Under the direction of the San Diego County DEH, Mr. Etchells designed, installed, and sampled groundwater wells on behalf of the North County Fire Protection District for groundwater monitoring. As a result, he successfully obtained closure of the unauthorized release from the San Diego County DEH.

Operating Automobile Dealership, San Diego, CA. The active automobile dealership had contaminated soil and groundwater impacted by former leaking USTs. Mr. Etchells conducted a subsurface investigation at the site which included the collection of hydrogeologic and subsurface contaminant data used for a conceptual site model prepared by Mr. Etchells. As a result, a conceptual site model along with a subsurface assessment report were used to support a real estate transaction for the dealership.

Building Material Sampling and Subsurface Assessment/Remediation at Former Metal Plating Facility. Mr. Etchells conducted soil and building material sampling at a former metal plating facility in accordance with requirements of the US Environmental Protection Agency (EPA) Unilateral Administrative Order. He completed the sampling under the direct supervision of the EPA's START program. The START program is responsible for overseeing emergency actions to stabilize sites that contain releases posing an immediate threat to human health or the environment. Mr. Etchells completed a subsurface assessment in addition to designing an in situ chemical reduction remedial plan to mitigate a groundwater plume of chlorinated solvents and hexavalent chromium.

Former Chemical Storage and Transfer Facility. This former chemical storage and transfer facility had a fractured bedrock groundwater regime. Mr. Etchells managed the operations and maintenance activities for pump-and-treat remediation, along with overseeing the plume containment system at the facility. His responsibilities included completing a down-hole geophysical survey and groundwater elevation study of an open borehole monitoring well network, while executing a quarterly groundwater monitoring program and redesigning a groundwater remediation system. Mr. Etchells characterized rock and soil components for the installation of additional monitoring wells that augmented the existing monitoring well network.

Operating Oil Refinery. Mr. Etchells conducted a subsurface investigation at a tidally influenced operating petroleum refinery containing over 100 monitoring wells. His responsibilities involved managing and overseeing the geologic characterization resulting from the exploratory drilling and well installation, along with coordinating a quarterly groundwater monitoring program for this site, and analyzing rock, soil, and hydrogeologic data. In order for Mr. Etchells to obtain subsurface groundwater flow characteristics in a remedial system design, he conducted monitoring well pump tests and the extraction of the well pumps. The analytical results were used to produce graphical interpretations and depictions, which included geologic cross sections, fence diagrams, isopach maps, iso-concentration maps, plume diagrams, hydrographs, and groundwater contour maps. In addition to the subsurface investigation, Mr. Etchells participated in designing and implementing a groundwater and free-phase liquid capture system, while maintaining an employee health and safety program for environmental field employees to facilitate using Office of Safety and Health Administration (OSHA) and refinery requirements.

Residential Housing Projects. Mr. Etchells completed geotechnical and karstic geohazard studies using geologic map and site-specific geologic data references, aerial photography interpretations, field reconnaissance, while including exploratory excavation and cone penetrometer surveys.

Landfill Gas Installations. Mr. Etchells has a wide range of experience with installation of landfill gas extraction systems at several landfills in Southern California. Sites includes Otay (operating), Valley Center, Palomar Airport, and Rancho San Joaquin Golf Course Landfills (closed with ongoing monitoring).

Los Angeles Unified School District Indoor Air Sampling, Los Angeles, CA. Mr. Etchells supported data collection activities associated with indoor air sampling and a human HRA. He managed the collection of indoor air samples and a fugitive dust survey in an operating grade school for model inputs.

City of San Marcos, Lake San Marcos Assessment, San Marcos, CA. SCS provided assistance to the City of San Marcos, working specifically with their San Marcos Technical Group (comprised of multiple agencies and environmental groups and led by the City of San Marcos), to implement a voluntary Total Maximum Daily (TMD) load program, which included Phase I diagnostics to assist in the development of an EPA-funded surface water model. Mr. Etchells designed, permitted, and installed a monitoring well network in the vicinity of Lake San Marcos to support data collection requirements. He completed aquifer characterization through pneumatic slug testing, groundwater monitoring, and sampling activities.

Ethanol Surface Spill, San Diego, CA. A surface spill of approximately 3,500 gallons of ethanol with trace quantities of gasoline took place in Mission Valley in San Diego. Mr. Etchells obtained regulatory closure from the San Diego County DEH Voluntary Assistance Program to conduct a subsurface assessment work plan and delineate the extent of ethanol impacts to shallow soil. The preparation and implementation of this assessment involved interpreting the degree of ethanol natural attenuation in support of the closure request.

Burbank Studio Offices, Due Diligence/Redevelopment Project, Burbank, CA. Mr. Etchells supported the redevelopment of the southern half of the Burbank Studios lot in downtown Burbank, known as Burbank Studio Offices. He completed subsurface investigations to delineate subsurface contamination associated with former uses and undocumented fill found on the site. Lithologic and analytical characterization were determined using geophysical surveys, exploratory excavations, drilling, and in situ techniques, including x-ray fluorescence and laboratory analyses. Mr. Etchells managed field activities associated with fill and native sediment characterization, including simultaneous implementation of South Coast Air Quality Management District (SCAQMD) Rule 1466, waste stream management, and segregation of excavated fill soils to ensure proper waste documentation for disposal.

City of Adelanto, Wastewater Treatment Plant Groundwater Monitoring Program Assistance, Adelanto, CA. Mr. Etchells managed the design and implementation of assessment activities associated with a release of elevated concentrations of dissolved nitrate from plant operations to underlying beneficial-use groundwater. He utilized several analytical techniques, including isotope analysis, to verify the source of dissolved nitrate with multiple lines of evidence. A Conceptual Site Model and various assessment work plans were approved by the Lahontan RWQCB.

Former Dry Cleaner Residential Redevelopment, Ontario, CA. Mr. Etchells managed the assessment and mitigation of subsurface impacts caused by historical dry-cleaning activities to support redevelopment into residential housing under the regulatory oversight of the DTSC. DTSC oversight of redevelopment activities was completed under a California Land Reuse and Revitalization Act (CLRRRA) agreement. Mr. Etchells managed the timeline of the CLRRRA agreement including communication with all project stakeholders including the surrounding community by attending and participating in public comment meetings with municipal representatives.